

73/1.89 Cal. Brin  
Roughness or wear  
104 Surface testing  
105 Roughness  
78 Hardness  
133822

81 penetrator/indenter  
82 ?

We claim:

- ✓ 1. An apparatus for measuring surface features in machined parts comprising:
  - a) a fixture to hold an impressionable material in fixed position against a surface feature for the period needed for the impressionable material to conform to the surface feature and register the shape of the surface feature;
  - b) said fixture removable such that the profile created in the impressionable material remains substantially unchanged by removal; and ~~and~~
  - c) said fixture mountable in a profiling device repeatably from measurement to measurement.
- ✓ 2. The apparatus of Claim 1 wherein said fixture is further comprised of a positioning element and a measuring element:
  - a) said positioning element locating features on parts to be measured by reference to at least one datum for each measurement location;
  - b) said measuring element being removably fitted to said positioning element to hold said measuring element in alignment with said positioning element; and
  - c) said measuring element removable from said positioning element and configured to be mountable in a profiling device repeatably from measurement to measurement.
- ✓ 3. The apparatus of Claim 2 wherein said measuring element has a free axis of movement such that the impressionable material may be moved toward or away from the surface feature being profiled.
- ✓ 4. The apparatus of Claim 3 further comprising an adjustable stepped gage block to regulate the position of the impressionable material in relation to the surface feature being measured.
- ✓ 5. The apparatus of Claim 1 wherein said fixture contacts at least one datum of the part being measured to provide reference location.

- 0 ~~1~~ The apparatus of Claim 2 wherein said positioning element contacts at least one datum of the part being measured to provide reference location.
- ✓ 7. The apparatus of Claim 1 wherein said fixture is fitted to hold said positioning element in contact with at least one datum of the part being measured to provide reference location.
- 0 8. The apparatus of Claim 2 wherein said positioning element is fitted to hold said positioning element in contact with at least one datum surface of the part being measured to provide reference location.
- 0 9. The apparatus of Claim 1 wherein said fixture is spring loaded to hold said fixture in contact with at least one datum surface of the part being measured to provide reference location.
- 0 10. The apparatus of Claim 2 wherein said positioning element is spring loaded to hold said positioning element in contact with at least one datum surface of the part being measured to provide reference location.
- 0 11. The apparatus of Claim 1 wherein the impressionable material is supplied in cylindrical form and is positioned in a V shaped block which is a part of said fixture.
- 0 12. The apparatus of Claim 2 wherein the impressionable material is supplied in cylindrical form and is positioned in a V shaped block which is a part of said measuring element.
- 0 13. The apparatus of Claim 1 wherein the impressionable material is a wax.
- 0 14. The apparatus of Claim 2 wherein the impressionable material is a wax.
- ✓ 15. An apparatus for measuring edges in machined parts comprising:

- a) a fixture to hold an impressionable material in fixed position against an edge for the period needed for the impressionable material to conform to the edge and register the shape of the edge;
- b) said fixture having a positioning element and a measuring element;
- c) said measuring element removably fitted to said positioning element in a manner to hold said measuring element in alignment with said positioning element;
- d) ~~said measuring element removable from said positioning element~~ such that the profile created in the impressionable material remains substantially unchanged during removal; and
- e) said measuring element configured to be mountable in a profiling device repeatably from measurement to measurement.

16. The apparatus of Claim 15 wherein said measuring element has a free axis of movement such that the impressionable material may be moved toward or away from the edge being profiled.

17. The apparatus of Claim 16 further comprising an adjustable stepped gage block to regulate the position of the impressionable material in relation to the edge being measured.

18. A method for measuring surface features in machined parts comprising:

- a) holding an impressionable material with a fixture in fixed position against a surface feature for a period of time sufficient for the impressionable material to conform to the surface feature and register the shape of the surface feature;
- b) removing the fixture from the surface feature while maintaining the profile of the surface feature substantially unchanged by removal; and
- c) mounting the fixture in a profiling device repeatably from measurement to measurement.

19. The method of Claim 18 comprising using a stepped gage block to regulate the position of the impressionable material in relation to the surface feature being measured.

✓ 20. The method of Claim 18 comprising using at least one datum of the part being measured to provide reference location.

② → 21. The method of Claim 18 comprising using a spring loaded fixture to hold the fixture in contact with at least one datum surface of the part being measured to provide reference location.

✓ 22. A method for measuring edges in machined parts comprising:

- a) holding an impressionable material in fixed position against an edge using a fixture having a positioning element and a measuring element;
- b) holding the impressionable material in fixed position for a period of time sufficient for the impressionable material to conform to the edge and register the shape of the edge;
- c) holding the measuring element in alignment with the positioning element, the measuring element being removably fitted to the positioning element;
- d) removing the measuring element from the positioning element while maintaining the profile created in the impressionable material substantially unchanged during removal; and
- e) configuring the measuring element to be mountable in a profiling device repeatably from measurement to measurement.

✓ 23. The method of Claim 22 comprising using a stepped gage block to regulate the position of the impressionable material in relation to the surface feature being measured.

② ✓ 24. The method of Claim 22 comprising using at least one datum of the part being measured to provide reference location.

→ 25. The method of Claim 22 comprising using a spring loaded part registration plate to hold the positioning element in contact with at least one datum of the part being measured to provide reference location.